

What is claimed is:

1. A method of producing a molecularly-imprinted chemical detection device comprising the steps of:
 - a) modifying the surface of a solid support through the attachment of functional groups;
 - b) reacting the solid support with a derivatized molecular target to form a molecular target bound solid support;
 - c) reacting the molecular target bound solid support with at least one guest molecule thus forming a solid support stamp having a binding cavity around the molecular target;
 - 10 d) applying the solid support stamp to a surface of a solid substrate to attach the binding cavity to the solid substrate; and
 - e) removing the molecular target and solid support to produce a molecularly-imprinted polymer on the surface of the solid substrate.
- 15 2. The method of claim 1 wherein the at least one guest molecule is at least one derivatized functional monomer forming at least one functional monomer recognition element around the molecular target.
3. The method of claim 2 wherein at least two functional monomer recognition elements 20 are polymerized to form the binding cavity around the molecular target.
4. The method of claim 1 wherein the guest molecule is at least one derivatized functional polymer.
- 25 5. The method of claim 1 wherein a silicon wafer solid support is modified.
6. The method of claim 1 wherein the surface of the solid support is modified with amino-siloxane.
- 30 7. The method of claim 1 wherein the coated slide is a coated glass slide.

8. The method of claim 6 wherein a coated slide is coated with one of gold and silicon dioxide.
9. The method of claim 1 wherein a plurality of binding cavities are attached to the solid substrate producing a plurality of molecularly-imprinted polymers.
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10. The method of claim 9 wherein at least two different binding cavities are attached to the solid substrate producing at least two different molecularly-imprinted polymers segregated into separate areas.
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11. The method of claim 1 wherein the solid support stamp is applied to a surface of a solid substrate having an area of about 1 to 2 cm².
12. A method of producing a solid support stamp comprising the steps of:
15 a) modifying the surface of a silicon wafer by attaching functional groups;
 b) reacting the silicon wafer with a derivatized molecular target to form a molecular target bound solid support; and
 c) reacting the molecular target bound solid support with at least one guest molecule thus forming a binding cavity around the molecular target.
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13. The method of claim 12 wherein the at least one guest molecule is at least one derivatized functional monomer forming at least one functional monomer recognition element around the molecular target.
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14. The method of claim 13 wherein at least two functional monomer recognition elements are polymerized to form the binding cavity around the molecular target.
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15. The method of claim 12 wherein the guest molecule is at least one derivatized functional polymer.

16. A method of producing a molecularly-imprinted chemical detection device using a solid support stamp produced from a molecular target bound solid support, having a binding cavity around the molecular target comprising the steps of:

5 a) applying the solid support stamp to the surface of a solid substrate to attach the binding cavity to the solid substrate; and

 b) removing the molecular target bound solid support to produce a molecularly-imprinted polymer on the surface of the solid substrate.

17. The method of claim 16 wherein the solid support stamp is applied to a surface of a

10 coated slide.

18. The method of claim 17 wherein the coated slide is a coated glass slide.

19. The method of claim 17 wherein the coated slide is coated in one of gold and silicon

15 dioxide.

20. The method of claim 16 wherein a plurality of binding cavities are attached to the solid substrate producing a plurality of molecularly-imprinted polymers.

20 21. The method of claim 16 wherein at least two different binding cavities are attached to the solid substrate producing at least two different molecularly-imprinted polymers segregated into separate areas.

22. A molecularly-imprinted chemical detection device comprising:

25 a planar solid substrate

 at least one molecularly-imprinted polymer imprinted on a surface of the planar solid substrate.

23. The device of claim 22 wherein the solid substrate is a coated slide.

30 24. The device of claim 23 wherein the coated slide is a coated glass slide.

25. The device of claim 23 wherein the coated slide is coated in one of gold and silicon dioxide.

5 26. The device of claim 22 wherein a surface of the planar solid substrate has an area of about 1 to 2 cm².

27. A method of detecting a chemical target using a molecularly-imprinted chemical detection device comprising the steps of:

10 a) exposing the molecularly-imprinted chemical detection device to the chemical target; and

b) directly detecting the binding of the chemical target to at least one molecularly-imprinted polymer imprinted on a surface of the molecularly-imprinted chemical detection device.

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28. The method of claim 27 wherein the binding of the chemical target to at least one molecularly-imprinted polymer imprinted on a surface of the molecularly-imprinted chemical detection device is directly detected using surface plasmon resonance, photonic detection, evanescent detection or cantilever detection.

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29. The method of claim 27, further comprising determining a concentration of chemical targets bound to the at least one molecularly-imprinted polymer imprinted on a surface of the molecularly-imprinted chemical detection device.

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